

Claims

1. An elastic wheel comprising
a rim for mounting a tire extending in a circumferential direction,
a disk to be fixed to an axle, and
a connecting apparatus for connecting elastically between the rim and the disk,
the connecting apparatus comprising
a pair of axially spaced internal flanges each provided on an inner circumference side of the rim and protruding therefrom toward radially inwardly and extending in the circumferential direction,
an external flange provided on a radially outer portion of the disk, the external flange disposed in a space between the internal flanges with an axial gap on its both sides and extending in the circumferential direction,
a pair of rubber dampers each disposed in the axial gap and connecting between the internal and external flanges, wherein
each internal flange is provided on its axially inner side with at least one first groove extending in the circumferential direction,
the external flange is provided on its both sides with at least one second groove extending in the circumferential direction so as to face the first groove of each internal flange,
axial one end of each rubber damper is inserted into the first groove of the internal flange and the other end is

inserted into the second groove of the external flange, and
a radial gap is provided between the external flange
and the inner circumference side of the rim in the space.

2. The elastic wheel according to claim 1, wherein
the internal flange is provided on its axially inner
side with a plurality of circumferentially spaced first
grooves,

the external flange is provided on its both sides
with a plurality of circumferentially spaced second grooves,
and

a plurality of circumferentially spaced rubber
dampers are disposed in each axial gap.

3. The elastic wheel according to claim 1, wherein
at least one internal flange can be detached from the
rim.

4. The elastic wheel according to claim 1, wherein
at least one internal flange comprises

a base portion firmly formed on the inner
circumference side of the rim, and

a flange plate attached to the base portion by
a screw device so that the flange plate can be
detached from the base portion easily.

5. The elastic wheel according to claim 1, wherein
a buffer device is provided in the radial gap for
reducing the impact force which is generated when the

radially outer surface of the external flange comes into contact with the inner circumference side of the rim.

6. The elastic wheel according to claim 1, wherein the first groove, the second groove and the rubber damper sandwiched therebetween are each an annular shape extending continuously in the circumferential direction.
7. The elastic wheel according to claim 1, wherein the rubber damper comprises a complex material including a rubber part and a cord.
8. The elastic wheel according to claim 1, wherein the rubber damper comprises a complex material including a rubber part and a cord extending in the circumferential direction.
9. The elastic wheel according to claim 1, wherein the rubber damper comprises a complex material including a rubber part and a cord extending in the axial direction.
10. The elastic wheel according to claim 1, wherein the rubber damper comprises a complex material including a rubber part and a cord extending in the radial direction.
11. The elastic wheel according to any claim 7, 8, 9 or 10, wherein

the cord is an organic cord or a steel cord.

12. The elastic wheel according to claim 1, wherein the rubber damper is compressed in the axial direction between the first groove of the internal flange and the second groove of the external flange.

13. The elastic wheel according to claim 12, wherein the internal flanges comprise a first internal flange firmly formed on the inner circumference side of the rim previously, and
a second internal flange welded on the inner circumference side of the rim afterwards.

14. A method of manufacturing the elastic wheel according to claim 12, wherein the method comprises
preparing the rim main body having a first internal flange being firmly formed on the inner circumference side thereof in advance and a second internal flange to be attached to the inner circumference side of the rim afterwards separately,
preparing a pair of the rubber dampers which were cured in advance,
preparing the disk provided with the external flange having the second groove,
preassembling the rim, the rubber dampers and the second flange so that axial ends of each rubber damper are inserted in the first groove and the second groove,
compressing the rubber dampers sandwiched between the

first flange and the second flange in the axial direction by pushing the second internal flange toward the first internal flange, and

welding the second internal flange to the inner circumference side of the rim while keeping compressing the rubber dampers.

15. The method of manufacturing the elastic wheel according to claim 14, wherein

a compression force between the first internal flange and the second internal flange is in the range of from 15 to 25 kN.